Claims

What is claimed is:

1. In a multicarrier transceiver, a system for allocating subcarriers to subscribers, comprising a subcarriers allocation controller, connected to a subcarrier modulation unit in a transmitter and to a subcarrier demodulation unit in a receiver for setting a group of subcarriers to be used therein, wherein the transmitter and the receiver are part of the transceiver and wherein the subcarriers allocation is made according to a Reed-Solomon code.

2. The systems for allocating subcarriers to subscribers according to claim 1, wherein the transceiver is a wireless cellular device.

3. The systems for allocating subcarriers to subscribers according to claim 1, wherein the transceiver is a xDSL cellular device.

4. A systems for allocating subcarriers to subscribers, comprising:
   A. a serial to parallel converter for the serial transmit data;
   B. a subcarrier modulation unit connected to said converter;
   C. a subcarriers allocation controller connected to the modulation unit;
   D. a multicarrier modulation unit; and
   E. a parallel to serial converter, which generates the transmit data out (serial).

5. The systems for allocating subcarriers to subscribers according to claim 4, wherein the subcarriers allocation controller allocates subcarriers using a Reed-Solomon (R-S) codes scheme.

6. The systems for allocating subcarriers to subscribers according to claim 4, wherein the subcarriers allocation controller allocates subcarriers using, for each subscriber, a shifted version of a Reed-Solomon (R-S) code.

7. The systems for allocating subcarriers to subscribers according to claim 5, wherein the subcarriers allocation controller allocates subcarriers using, for adjacent subscribers, a shifted version of a Reed-Solomon (R-S) code that are separated by more than one step difference.

8. The systems for allocating subcarriers to subscribers according to claim 5, using a group of 22 carriers is allocated to one user, another user will be allocated a cycled version of the group.

9. In a multicarrier system, a method for allocating subcarriers to subscribers, comprising the steps of:

A. keep a table of R-S codes for frequency group allocation to base stations;

B. assign one set of subcarriers based on R-S codes to a base station;

C. assign other sets of subcarriers based on R-S codes to other base stations in such a way that adjacent base stations have different R-S codes, to minimize the number of collision points therebetween.

10. The method for allocating subcarriers to subscribers according to claim 9, wherein in the multicarrier system having N subcarriers available, numbered 0 to N-1, a first base station will be assigned subcarriers Fa, Fb, Fc ... wherein a, b, c... are members of an R-S code.

11. The method for allocating subcarriers to subscribers according to claim 9, further including the step of:

D. where a base station has sectored coverage, a plurality of codes are assigned to that station for use with the various sectors.

12. The method for allocating subcarriers to subscribers according to claim 9, further including the steps of:

E. base station keeps a table of available codes, wherein part of the codes are tagged "free" whereas the others are "in use" ;

F. when a new subscriber gains access through a base station, the subscriber is assigned one or more of the codes for that cell;

G. when a subscriber leaves the cell, his R-S code is tagged as "free" ;

H. a new subscriber is assigned a shifted version of the code;

I. different codes are allocated in various sectors, and taking into account the code of the nearby cell.

13. The method for allocating subcarriers to subscribers according to claim 12, further including the step of allocating several codes to each station for near/far subscribers, and separating far/near subscribers using different codes.

14. The method for allocating subcarriers to subscribers according to claim 12, further including the step of allocating several codes to each of several adjacent users within one cell, to decrease the interference resulting from Doppler, phase noise or collissions with other subscribers.

15. The method for allocating subcarriers to subscribers according to claim 12, wherein the code includes the subcarriers numbered:

0, 5, 2, 10, 4, 20, 8, 17, 16, 11, 9, 22, 18, 21, 13, 19, 3, 15, 6.